

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**

(19) World Intellectual Property Organization  
International Bureau(43) International Publication Date  
22 March 2001 (22.03.2001)

PCT

(10) International Publication Number  
WO 01/19205 A1

(51) International Patent Classification<sup>7</sup>: A23G 3/28, B65D 83/00

(21) International Application Number: PCT/EP00/08730

(22) International Filing Date: 7 September 2000 (07.09.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: P 9902028 13 September 1999 (13.09.1999) ES

(71) Applicant (for AE, AG, AU, BB, BZ, CA, CY, GB, GD, GH, GM, IE, IL, KE, LC, LK, LS, MN, MW, NZ, SD, SG, SL, SZ, TT, TZ, UG, ZA, ZW only): UNILEVER PLC [GB/GB]; Unilever House, Blackfriars, London EC4P 4BQ (GB).

(71) Applicant (for all designated States except AE, AG, AU, BB, BZ, CA, CY, GB, GD, GH, GM, IE, IL, IN, KE, LC, LK, LS, MN, MW, NZ, SD, SG, SL, SZ, TT, TZ, UG, US, ZA, ZW): UNILEVER PLC [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL).

(71) Applicant (for IN only): HINDUSTAN LEVER LIMITED [IN/IN]; Hindustan Lever House, 165/166 Backbay Reclamation, Mumbai 400 020, Maharashtra (IN).

(72) Inventors; and

(75) Inventors/Applicants (for US only): HUNTER, Jeffrey [GB/GB]; Birds Eye Wall's Ltd, Innovation Centre, Walls House, Barnwood, Gloucestershire GL4 3HB (GB). OLIVERAS PICO, Jaume [ES/ES]; Frigo S.A., Peru 84, E-08018 Barcelona (ES).

(74) Agent: EVANS, Jacqueline, Gail, Victoria; Unilever PLC, Patent Dept., Colworth House, Sharnbrook, Bedford, Bedfordshire MK44 1LQ (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TI, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

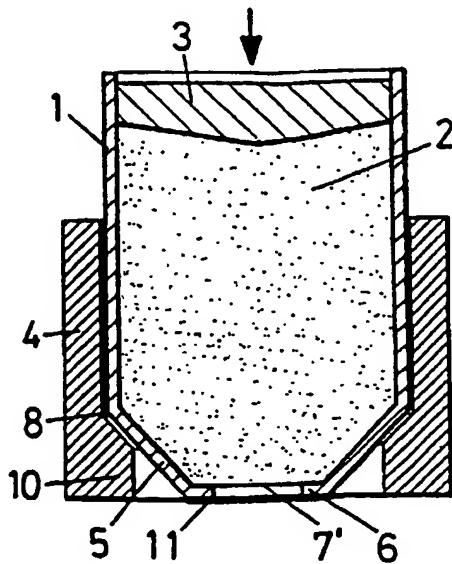
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— With international search report.

[Continued on next page]

(54) Title: DISPENSING PACK AND MACHINE



(57) Abstract: An ice-cream container pack that forms a replaceable cartridge in an associated dispensing machine, said pack comprising a cylindrical body fitted with a nozzle and a plunger which, when operated by the piston of said machine, dispenses the ice cream from the pack via said nozzle, said pack being characterised in that the bottom edge (8) of the cylindrical body wall (1) is directly attached to the end wall (5), said end wall being in the form of a truncated cone, the smaller and free base of which houses the extrusion nozzle (7), whereby a part of the end wall (5) constitutes the support base for the pack on the support (4') with which said dispensing machine is provided.

WO 01/19205 A1



— *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

DISPENSING PACK AND MACHINE

5

**SUBJECT OF THE INVENTION**

The present invention lies in the sphere of container packs  
10 for edible ice-cream products and, more specifically, that of  
disposable and preferably single-serving packs designed so that the  
product they contain is dispensed by extrusion.

When ice-cream is dispensed from a pack of this type, the  
15 shape of the extruded product is determined primarily by the form  
of the nozzle through which it passes. The primary objective of the  
present invention is to ensure that the product is extruded in  
optimal condition ensuring, in particular, that disfigurement of  
20 the extruded product, as a result either of accumulation of product  
around the nozzle on the outside of the pack, or of deformation of  
the nozzle during extrusion, is minimised.

An additional advantage of the design of this pack is that it  
helps to keep the dispensing nozzle itself clean, together with the  
25 pack in general, so that said pack is able to comply with the most  
stringent standards of hygiene.

Extrusion of the ice cream from the pack is most conveniently  
achieved with the aid of a machine and a further aspect of the  
30 present invention is accordingly the design of a machine to  
complement the novel pack design in achieving the improved quality  
of the dispensed product. It is anticipated that such machines will  
prove particularly well suited for dispensing ice-cream, from

individual packs according to the invention into receptacles such as plates or cups or any other such suitable container more attractive for consumption of the product, at ice-cream distribution stalls, cafes, restaurants, etc.

5

**PRIOR ART**

10 In the field of edible ice-cream, the technique of serving by extrusion from a suitable pack has long been known.

15 Two basic versions of the extrusion system are well-known; one where the ice-cream is served at the time of use by the consumer itself, and the other where a machine is used to serve the ice-cream product to said consumer.

20 Systems of the former type generally comprise tubular, cylindrical packs, generally constructed of plastic-coated cardboard, housing a plunger, which is also cylindrical, extending axially into an operating rod and sealed at the other end with a cap so that, while the product remains in storage, it is completely protected inside the pack by said cap and by the plunger itself. For consumption, the cap is removed and the user gradually presses 25 on the operating rod to push the ice-cream product out, also gradually, through the opening in the pack left by the cap.

30 Machines designed primarily for dispensing multiple servings of edible ice-cream by extrusion are also well-known. Such machines are generally equipped with a cylinder, which may be filled with a considerable amount of ice-cream, and an extrusion nozzle. The

plunger fitted to said cylinder is used, in a design similar to a standard "churrera" or doughnut-maker, to push the product out, extruded through said nozzle, and place it in any type of recipient for consumption.

5

More recently, machines without said cylinder have been used, which are fitted just with an operating plunger and die. These are designed to be used together with "cartridges" which can hold a suitable volume of ice-cream and are provided with a plunger which, 10 on introduction into the machine, forms an addition to its piston. These cartridges have a twin function, on the one hand as a suitably sealed pack for transportation of the ice-cream product in optimal conditions of hygiene from its place of manufacture to the distribution points where the associated machines are installed 15 and, on the other, as a cylinder on the dispensing machine itself, so that no further handling is required at those points beyond the replacement of a used cartridge with a new one following dispensing of the ice cream.

20

Packs of this "cartridge" type consist of a cylindrical body, one of the outlets of which is intended to act as a circumference seat on the associated support of the extruding machine. During storage and transportation of the pack, this end of the cylinder needs to be sealed, usually by means of a fine disc appropriately 25 affixed to the aforesaid outlet, for instance by heat-welding. The other end of the cylindrical body is sealed by the plunger itself, which will be operated by the machine as the product is served.

Conventionally in a pack of this type, the extrusion nozzle 30 is located at the end of a truncated cone structure which converges

5 towards the bottom end of the cylinder, for preference on the geometric axis of the pack. The extrusion hole itself may have one of any number of shapes - star, polygon, etc. Since this truncated cone structure is not sealed off from the ice-cream product during storage and transportation, it must be contained within the cap that seals the end of the pack prior to dispensing. It therefore has to be recessed with respect to the bottom end of the outer cylindrical wall of the pack, and a space is consequently left between the inner truncated cone wall, the sealing cap and the 10 cylindrical side wall.

15 In practice, packs of this type present problems basically centred around two aspects. Firstly, in the course of pack handling operations, for instance filling on the production line and transportation of the packs, part of the ice-cream product often flows through the extrusion opening into the space between the inner cone wall surrounding the nozzle, the side wall of the cylindrical body and the sealing cap. When the ice-cream is served, material accumulated in this space may be dispensed along with 20 newly extruded product which is disadvantageous because it causes the end product to lose a substantial part of the shape formed by said nozzle, so that a serving of the product differs considerably in appearance from that intended.

25 Secondly, since the whole pack rests on the support around the circumference of its tubular body, there is no direct support of the inner truncated-cone wall around the nozzle during extrusion. Consequently the cone structure is liable to be forced out of shape by the actual extrusion pressure. This in turn affects

the shape of the served product, further contributing to making said shape substantially different from that intended.

## 5 DESCRIPTION OF THE INVENTION

10 The present invention comprises a novel design of pack from which ice cream may be dispensed by extrusion, together with a machine to effect the dispensing. The improvements represented by the invention offer a satisfactory solution to the problems referred to above.

15 The pack of the present invention incorporates a cylindrical body, designed to contain a suitable volume of ice-cream and sealed at one end by an extrusion plunger in the normal way. It is distinguished from the prior art, however, by the key innovation that the other end wall, in which the extrusion nozzle is located, is attached directly to the bottom edge of said cylindrical body, 20 rather than being recessed with respect to this edge, as is normally the case. This allows the sealing cap to be situated directly on the end wall where the nozzle is located, so that there is no possibility of any product emerging through the nozzle during storage and handling of the pack, until the time when it is opened. 25 Thus when the ice cream is served, all the dispensed material will be newly extruded from the nozzle and will therefore have improved retention of the shape conferred by the nozzle aperture, in comparison to product dispensed from previously known packs.

30 In addition, the pack design allows the dispensing machine to support the pack directly on its end wall, rather than just at the

circumference, on the side walls, as is conventionally the case. Specifically, the end wall is in the form of a truncated cone, the smaller and free base of which houses the extrusion nozzle, and the machine is provided with a support having an angled surface 5 designed to be complementary to this truncated cone structure. This provides important beneficial effects in the serving of the product. First, any deformation of the aforesaid truncated cone wall during extrusion is minimised, resulting in better control of the shape of the extruded product. Second, and especially if said 10 support surface is warmed, it produces a slight and beneficial increase in the temperature of the bottom area of the pack, thus enabling the product to flow more readily towards the extrusion nozzle, so that dispensing is possible with less pressure on the plunger, thereby further reducing the risk of deformation in the 15 walls surrounding said extrusion nozzle.

Said localised warming is designed not to affect significantly either the walls of the pack away from the immediate vicinity of the extrusion nozzle or the ice-cream contained within, 20 so that there is no deleterious effect on the quality of the dispensed ice-cream but, on the other hand, it does have the additional advantage of making the surface of the extruded product very smooth, thus further enhancing its appearance.

25 The body of the pack is in the form of a cylinder, the cross section of which may be circular, oval, polygonal or any other shape, with the only restriction being that said cross-section must be constant along the length of the cylinder, so that when the ice-cream is dispensed the sliding plunger cap remains in close contact 30 with the walls of the pack as it is driven down towards the base,

thereby expelling the ice cream effectively through the nozzle. The pack may optionally be fitted with an outer rim at the top end to facilitate holding of the pack in place for filling on an automated production line.

5

The pack and seal may be made of cardboard, plastic or any other material suitable for use with food. Suitable plastic materials would include polyethylene (PE), polystyrene (PS) and polypropylene (PP). The walls of the body of the pack should be 10 thick enough to ensure that the structure remains rigid during handling and product dispensing. In one practical embodiment, use was made of an injected polypropylene (PP) pack with side walls an average of 0.7 mm thick, and a base of 0.5 mm. When the pack and/or seal is made of card,, it is practical to coat the inside with a 15 sealable plastic layer (with polythene being particularly suitable for this purpose).

20

The capacity of the pack may, albeit without limitation, suitably be between 100 and 160 ml, especially 120 ml, for a single product serving.

25

The ice content of the ice-cream affects its firmness and hence the ease with which the product can be extruded. Suitably, the ice content may be in the range between 29% at -7°C and 42% at -12°C.

The serving temperature of the ice-cream should preferably be between -8°C and -12°C, although in practice it may go above or below these values.

5 In order to be suitable for serving and consumption, the ice-cream should preferably have a dissolved air content of between 60 and 120% of its total volume; a typical figure would be 70% of the total ice-cream volume.

10 The nozzle aperture may measure approximately 24-28 mm across, with an area of 200-400 mm<sup>2</sup>, depending on the shape of said aperture. This shape is important in facilitating the extrusion of the product; for instance, if the opening means that there is a large area of contact of the extruded ice-cream with the 15 surrounding air, this will raise the ice-cream temperature, making it easier to serve. A star-shaped aperture is particularly effective and creates an attractive extrudate shape but the points of the star should not be too small, otherwise they will be prone to blocking with particulates which, in turn, could increase the 20 shear on the ice-cream during extrusion, leading to damage to its bulk properties.

The extrusion dispensing of the ice-cream contained in the pack described uses a machine which forms part of the invention as 25 such and which is structured around a frame intended either for wall mounting or standing on a counter. In either case said frame includes a built-in lower mount to install and attach the ice-cream container pack, completed at the top with a housing containing a rack which has a ram at the base and which is positioned 30 vertically, specifically aligned with the pack holder housing. In

operation, as the rack descends the ram engages the plunger which is integral to the ice-cream pack, forcing it downwards within the cylinder of the pack and hence extruding the ice-cream through the nozzle located at the base. The force required to extrude this ice-  
5 cream product ranges from 60-170 Newtons under the conditions described above.

The upper housing suitably also contains a ring gear which meshes with the aforesaid rack and which is secured to an operating  
10 lever to enable the downward movement of the ram, against the tension of a return spring, as the pack is emptied, with a suitable receptacle for collecting the ice-cream in place beneath the nozzle outlet.

15 The aforementioned pack holder may be fixed, when the machine is intended specifically for packs of a given type, but may be adjustable where it is planned to use packs of different sizes, for one or more ice-cream servings, in the sense that the length of the ram stroke in said pack may be varied to maintain compatibility  
20 with packs of different axial dimensions.

The aforementioned holder is terminated, at the end opposite to where it is attached to the frame, in a bushing of a shape and size suitable to admit and hold the pack inside it, while  
25 preventing said pack from swaying sideways. Said bushing is fitted with a lower stop to stabilise said pack in the emptying position and mounts to provide support to the walls of the pack in the region surrounding the nozzle, as discussed above.

- 10 -

It will be appreciated that although the invention is described herein primarily with reference to its use in dispensing ice-cream, it is equally applicable for use in dispensing other frozen confections such as frozen water ices, frozen yoghurts, frozen 5 custards, sorbets and the like. Reference to ice-cream will accordingly to refer also to such other frozen confections unless otherwise indicated.

#### 10 DESCRIPTION OF THE DRAWINGS

To supplement this description and to contribute to a better understanding of the features of the invention in a preferred 15 embodiment, a set of drawings is accompanied forming an integral part hereof and which, by way of illustration and without limitation, show the following:

Figure 1 shows a diagrammatic side elevation and diametric 20 cross-section of a container pack for ice-cream dispensed by extrusion, designed according to the improvements which are the subject of the present invention.

Figure 2 is similar to figure 1, showing the same pack, duly 25 coupled to the extruding machine support.

Figure 3 is a bottom axial view of the same pack as in figure 1, showing two of the numerous possible configurations for the extrusion nozzle.

Figure 4 shows a perspective view of a machine for extruding ice-cream from disposable packs, produced in accordance with the object of the present invention.

5       Figure 5 shows a side elevation and cross-section view of the same machine.

Figure 6 lastly shows a profile view of the coupling between the rack and the ring gear operating it.

10

#### **A PREFERRED EMBODIMENT OF THE INVENTION**

15       These figures illustrate the structure of a pack produced according to the invention. The pack has a cylindrical body (1) of capacity suitable for the mass of ice-cream (2) it is to contain. At one end of said body (1), there is a plunger cap (3) which, besides being one of the elements for sealing the pack during its 20 storage and handling from the place of packing to the time of its consumption, is designed to receive the action of the piston of the machine (4) when it is required to serve the product (2).

At the other end, the body (1) of the pack is sealed by means 25 of a wall (5), of a truncated cone shape, the smaller and free base (6) of which houses the nozzle or extrusion opening (7) which may adopt one of the rounded vertex star forms in figure 3 or any other which may be deemed fit, such as square, rectangular, triangular, oval, etc. When the pack is in place in the dispensing machine, the 30 end wall (5) is in contact with the support (4') with which the machine is provided. The principle of operation is then that a

downward motion of the piston of the machine (4) drives the sliding cap of the pack (3) downward in turn, thereby forcing extrusion of the ice-cream through the nozzle (7) and into a suitable receptacle.

5

The focus of the distinguishing features of the pack produced according to the improvements of this invention is that the aforesaid end wall (5) is connected directly to the lower end or outlet (8) of the tubular body (1) so that, with the assistance of 10 internal radial mounts (10) fitted on the support (4') and angled according to the generatrix of the truncated cone sector (5), the pack can be supported as a whole on said support (4'), not only by way of the bottom outside edge of the actual body (1), but also by means of this shortened cone wall (5) thereby ensuring that 15 it will not be deformed by the pressure generated by the machine piston (4).

As a complement to the structure described, the pack is closed and sealed until its contents are to be consumed, with the 20 aid of a thin disc (11) which matches the smaller base (6) of the shortened cone partition (5) in shape and size, in other words solely and directly affecting the extrusion nozzle (7) so that, until the time when the contents (2) of the pack start to be consumed said contents are kept absolutely in position in the 25 chamber of the pack.

It is also foreseen that the overhanging portions (12) on the base (6) of the partition (5) forming the nozzle (7) (i.e. those portions not directly supported by the support (4')) are designed 30 and of dimensions to guarantee that they will bend minimally under

the pressure of the machine ram on the cap or plunger (3) in order, in turn, to minimise any deformation of the cross-section of the extruded product. A feature that further aids in the achievement of this objective is the thermal contact between the truncated cone 5 structure of the partition (5) and the radial mounts (10) of the support (4') which, with the warming of said support (4') and more specifically of said mounts (10), permits a slight rise in the temperature of the product (2) in the vicinity of the wall (5), enabling the ice-cream product (2) to slide more readily towards 10 the nozzle (7) therefore allowing it to emerge from the machine with lower pressure on the plunger cap (3). Said warming must not affect the main body of the pack or the ice-cream contained within, as this could damage its eating quality.

15        The machine (4) for extrusion dispensing of the ice-cream or product (2) contained in the pack (1) described is designed around a frame comprising a stand or base (13) to support the machine as a whole on a counter top, although this stand (13) is linked to the frame (4) by way of a removable coupling (14) so that said stand 20 may be used only when necessary and can be removed when, for instance, the machine (4) is mounted on a wall.

At the bottom of the frame and here located above the stand or base (13), the frame has a pack holder (15) which terminates in 25 a bushing which forms the aforementioned support (4'), and this vertical axis bushing or support (4') is of suitable size and shape to contain the pack (1) containing product (2) in a stable position, defined by an inner perimeter stop (16) on the support (4') and by a perfect side fit between the pack and support, as 30 shown particularly in figure 4.

To complement the structure described, the frame terminates at its upper end in a housing (17) containing a vertical rack (18), specifically set coaxially to the support (4') and to the pack (1).

5 Said rack terminates at the bottom with a ram (19) of suitable size and shape to enter the pack (1), acting on the moving cap or plunger (3) of the pack (1) as a pusher extruding the ice-cream (2) towards the bottom opening or nozzle (7) of the aforesaid pack (1) so that it emerges and drops under the force of gravity into any

10 receptacle (20) placed below.

In practice, the pack (1) and the support (4') may be configured in the manner shown in the figures or in any other way that ensures that the pack (1) is completely stable in the holder (15) and that the ram (19) is able to operate properly to expel the product. Accordingly, said ram (19) may be of a shape and size matching those of the bore of the pack (1) or, if the cap (3) of said pack is of a certain rigidity, it may be undersized.

20 The rack (18) moves vertically through a ring gear (21) which meshes with it and is operated manually by a lever (22) whose pivot pin traverses the housing (23) laterally so that the lever (22) is exterior to it and, therefore, fully accessible.

25 The machine is designed so that when the product has been dispensed, the rack (18) and more specifically the ram (19) revert automatically to an upper limit, a return spring (24) being fitted between said rack (18) and the housing (17) against which the lever (22) is pivoted as the pack (1) is emptied.

The pack (1) may comprise a single serving, so that all the contents (2) pass to the collecting receptacle (20) in a single operation; or else said pack (1) may hold several servings for distribution of the contents to various receptacles (20), in which 5 case the holder (15) should be height-adjustable so as to bring the position of the support (4') and, therefore, of the pack itself (1) into line with the stroke requirements of the rack (18).

In any case, according to the object of the invention, the 10 ice-cream product (2) made and marketed in plastic, cardboard or similar packs (1) may be consumed by the user in more attractive receptacles, such as a plate, a cup or any other glass, ceramic or similar item. Said pack (1) comprises a cartridge which, as has been mentioned above, has a sliding cap or plunger (3) which moves 15 with the ram (19), and a mouth or nozzle (7) which is initially sealed and can easily be opened, for example by using a thin disc (11) heat-welded to the outlet of said mouth or nozzle.

**CLAIMS**

5        1.- An ice-cream container pack that forms a replaceable cartridge in an associated dispensing machine, said pack comprising a cylindrical body fitted with a nozzle and a plunger which, when operated by the piston of said machine, dispenses the ice cream from the pack via said nozzle, said pack being characterised in  
10      that the bottom edge (8) of the cylindrical body wall (1) is directly attached to the end wall (5), said end wall being in the form of a truncated cone, the smaller and free base of which houses the extrusion nozzle (7), whereby a part of the end wall (5) constitutes the support base for the pack on the support (4') with  
15      which said dispensing machine is provided.

2.- An ice-cream container pack according to claim 1, wherein the pack is sealed at its bottom end, during storage and transportation of said pack, by means of a disc (11) of shape and size appropriate to the smaller free base of the truncated cone end-wall (5) where the nozzle (7) is situated, so that said disc (11) is attached directly to the part of the pack corresponding to said extrusion nozzle (7), said disc being readily removable to facilitate dispensing of the product.

25

3.- An ice-cream container pack according to either of the preceding claims, wherein the overhanging portions (12) of the base or central sector (6) of the shortened cone wall (5) defining the opening (7) or extrusion nozzle are minimally deformable by the  
30      forces delivered from the machine's piston to the plunger cap (3) of the pack during dispensing.

4. An ice-cream container pack according to any one of claims 1 to 3 wherein the pack is substantially rigid.

5 5. An ice-cream container pack according to any one of claims 1 to 4 wherein the pack is made of polypropylene.

10 6.- A machine for the extrusion dispensing of an ice-cream product contained in a pack designed to transfer the ice-cream product (2) from said pack (1) to a consumption receptacle (20), said machine comprising a frame (4) equipped with means to allow the machine to stand on a horizontal platform or to be wall mounted, said frame bearing a holder (15) for the ice-cream 15 container pack (1) and a means for driving a ram (19) which operates the plunger in said pack in order to extrude the ice cream, said machine being characterised in that the pack is a pack according to any one of claims 1 to 5 and that the pack housing (15) comprises a support (4') on which the truncated conical end 20 wall of said pack is directly seated.

25 7.- A machine according to claim 6, in which the support (4') for the ice-cream pack (1) is provided with inner radial mounts (10), said mounts having surfaces at an angle that matches that of the truncated cone end-wall (5) of the pack (1), thereby providing direct support to said end-wall.

30 8.- A machine according to claim 6 or 7 in which means are provided for heating the support (4') or heating radial mounts attached to said support (10), on which the truncated cone wall (5)

of the pack is seated during dispensing, thereby providing local warming of the ice cream in the vicinity of the extrusion nozzle (7) and improving the fluidity of the product as it is extruded.

5 9.- A machine according to any of claims 6 to 8, in which the means for driving the ram (19) comprises a rack (18) that terminates in said ram, said rack moving vertically within a housing (17), said housing being attached to the frame (4).

10 10.- A machine according to claim 9, in which the rack (18) is driven by a manually-operated lever (22) via a ring gear (21).

11.- A machine according to any of claims 6 to 10, wherein the frame (4) is fitted with a stand or base (13) to support the machine on a counter, said stand or base being attached to said frame by means of a coupling (14), enabling said stand (13) to be removed when the machine is intended for wall mounting.

12.-A machine according to any of claims 6 to 11, wherein the holder (15) for the pack (1) terminates at the end opposite to that where it is attached to the frame in a bushing, comprising a support (4') with a vertical axis, fitted with an internal perimeter stop (16), for stable coupling to the aforesaid pack (1), also arranged vertically, so that the sliding plunger cap (3) of said pack (1) faces the ram (19) of the rack (18), while the bottom outlet or nozzle (7) in the pack (1) is in turn over the receptacle (20) where the ice-cream is to be served.

13.-A machine according to any of claims 6 to 12, wherein the holder (15) for the ice-cream pack (1) is mounted on a frame and

can be height-adjusted to adapt the relative positions of said pack (1) and the ram (19) of the rack (18) to packs (1) of differing axial dimension and containing either one or several ice-cream servings.

5

14.-A machine according to any of claims 6 to 13, wherein the ram (19) reverts automatically to an upper limit position, to which end the rack (18) is connected to the housing (17) by way of a return spring (24), against which the rack (18) moves when the 10 lever (22) is operated.

1/2

Fig.1.

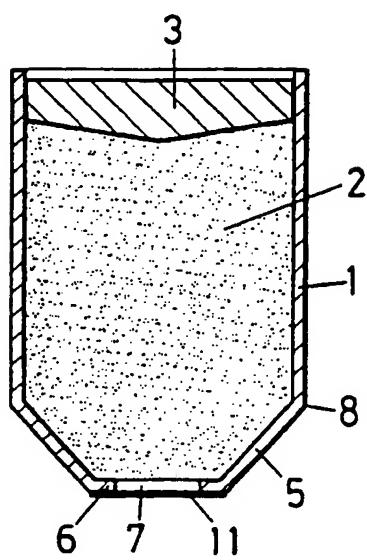


Fig.2.

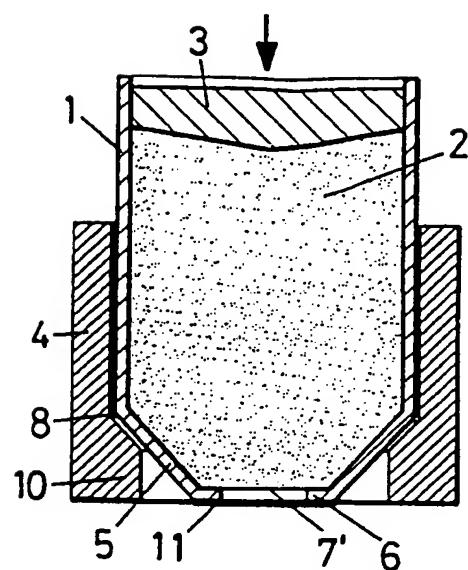


Fig.3.

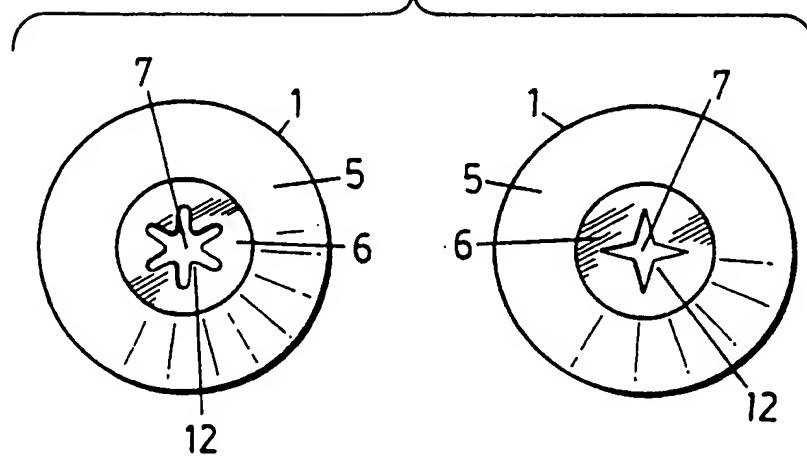


Fig.4.

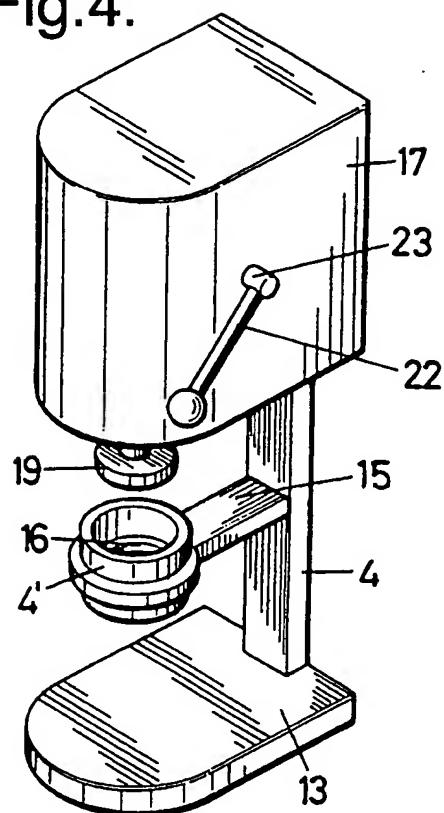


Fig.5.

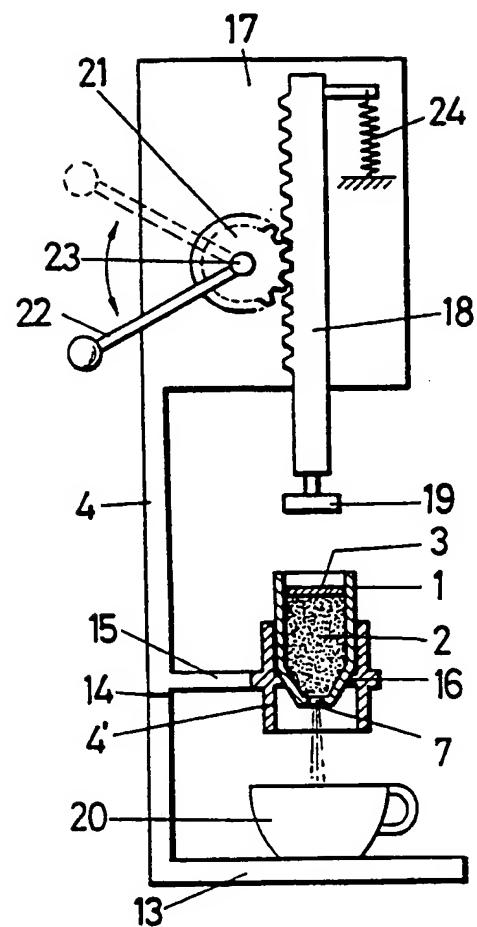
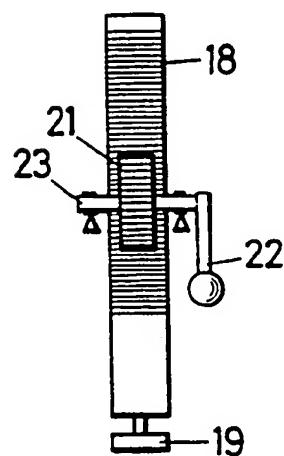


Fig.6.



# INTERNATIONAL SEARCH REPORT

Internati	Application No
PCT/EP 00/08730	

A. CLASSIFICATION OF SUBJECT MATTER	IPC 7 A23G3/28 B65D83/00
-------------------------------------	--------------------------

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A23G B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 33928 A (ZEELAND GREGORY RUSSELL VAN ;KELLY DAMIAN ANTHONY (AU)) 31 October 1996 (1996-10-31) abstract; figures 1,2,4	1,3,4
Y		6,7,9, 10,12,14
A	---	2,5
A	US 5 918 767 A (MCGILL SHANE ROBERT) 6 July 1999 (1999-07-06) abstract; figure 1	1
Y	---	6,7,9, 10,12,14
A	US 5 375 740 A (UMETSU NAOSHI ET AL) 27 December 1994 (1994-12-27) abstract; figures 1,2	1,2,4,6, 9,10,14
	---	-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the International filing date but later than the priority date claimed

- \*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the International search report

5 January 2001

16/01/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.  
Fax: (+31-70) 340-3016

Authorized officer

Martin, A

## INTERNATIONAL SEARCH REPORT

Internat	Application No
PCT/EP	00/08730

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2 889 949 A (M. NIRENBERG) 9 June 1959 (1959-06-09)  figures -----	1,2,6,7, 9,10,12, 13

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Internat.	Application No
PCT/EP 00/08730	

Patent document cited in search report	Publication date	Patent family member(s)			Publication date
WO 9633928	A 31-10-1996	AU 696352 B			10-09-1998
		AU 5393596 A			18-11-1996
		EP 0827480 A			11-03-1998
US 5918767	A 06-07-1999	AU 2802795 A			25-01-1996
		CA 2194224 A			18-01-1996
		EP 0768982 A			23-04-1997
		WO 9601224 A			18-01-1996
		JP 10502251 T			03-03-1998
		ZA 9505521 A			14-05-1996
US 5375740	A 27-12-1994	CA 2085996 A			27-10-1992
		WO 9219389 A			12-11-1992
		KR 9513988 B			20-11-1995
US 2889949	A 09-06-1959	NONE			